DOCUMENT RESUME

ED 146 781 FL 008 998

AUTHOR Le Ny, Jean-Francois
TITLE Psychosemantics and Simultaneous Interpretation.
PUB DATE Jul 77
NOTE 19p.; Paper presented at the NATO Symposium on Language, Interpretation and Communication (Venice, Italy, September 26-30, 1977)

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS *Cognitive Processes; Communication (Thought Transfer); Comprehension; *Interpreters; Language Skills; *Memory; Phonemics; *Psycholinguistics; Recall (Psychological); *Semantics; Sentence Structure; *Translation; Vocabulary
IDENTIFIERS Language Processing; *Psychosemantics

ABSTRACT

A comprehension model of simultaneous interpretation activity raises three types of problems: structure of semantic information stored in long-term memory, modalities of input processing and specific restrictions due to situation. A useful concept of semantic mnesic structures includes: (1) a componential-predicative lexicon; (2) a propositional structure of sentences, which provides general comprehension schemata; and (3) macro-structures. During interpretation a double activity occurs: comprehension and production. Comprehension may be conceived of as a decomposition of input speech into semantic features and their recomposition into blocks via semantic schemata. Interpretation is best when these schemata are in the output language. Simultaneous translation efficiency is apparently related to a decrease of phonemic components. Reciprocally, in spite of the additional retrieval and motor activities caused by emission, it seems that semantic recall is particularly high in interpreters. Temporal regulation is a problem specific to simultaneous interpretation. It may be considered as analogous to temporal regulation of information processing in semantic reading and learning; flow of semantic information determines the locking of semantic content and reemission rhythm. Some empirical data are presented to support these views. (Author/CLK)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

UNIVERSITE DE PARIS VIII

Laboratoire de Psychologie

ED146781

PSYCHOSEMANTICS AND SIMULTANEOUS INTERPRETATION

by

Jean-François LE NY

FL008998

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Jean Francois Le Ny

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

Route de la Tourelle
75571 PARIS CEDEX 12
(France)

Juillet 1977
Document n° 83

Le présent texte est une prépublication intérieure de l'E.R.A. 235. Il sera discuté par l'équipe et éventuellement révisé par l'auteur avant sa publication définitive.

Nous vous serions très reconnaissant si vous vouliez bien faire part à celui-ci de toutes vos critiques, observations ou suggestions concernant cette première version.

Vous pourriez simplement renvoyer le texte avec vos annotations en marge. Nous vous enverrions ultérieurement un tiré à part de l'article publié.

Nous vous remercions de votre intérêt.

L'E.R.A. 235

SUMMARY

A comprehension model of simultaneous interpretation activity raises three types of problems : structure of semantic information stored in long term memory, modalities of input processing and specific restrictions due to situation.

An useful concept of semantic mnesic structures includes : 1) a componential-predicative lexicon, 2) a propositional structure of sentences which provides general comprehension schemata and 3) macro-structures.

During interpretation a double activity occurs : comprehension and production. Comprehension may be conceived of as a decomposition of input speech into semantic features and their recomposition into blocks via semantic schemata. Interpretation is best when these schemata are in the output language.

Simultaneous translation efficiency is apparently related to a decrease of phonemic components. Reciprocally, in spite of the additional retrieval and motor activities caused by emission, it seems that semantic recall is particularly high in interpreters.

Temporal regulation is a problem specific to simultaneous interpretation. It may be considered as analogous to temporal regulation of information processing in semantic reading and learning : flow of semantic information determines the locking of semantic content and reemission rythm. Some empirical data are presented to support these views.

A psychosemantic analysis of simultaneous interpretation activity must obligatorily account for several interlocking types of problems ; their solutions are also, at least partially, interdependent. They will first be stated here, from the most specific to the most general, but will be discussed in the text in reverse order, from the general to the specific. There are thus three types of problems :

1) - those problems which are related to simultaneous interpretation It seems that they are related to a slight degree to the oral character of the communication which is thus established and to a much greater degree to the information flow which the interpreter must process under these conditions ;

2) - those problems which are proper to translation in general. It is generally admitted today, that this process is not a simple transformation of a text from input language to output language, but is rather a double transformation : the translator first transforms the input text into a certain type of representation of its sense, followed by a second transformation of this semantic representation into a new text in the output language ;

3) - if the preceding problems are raised from a psychosemantic point of view, they require the elucidation of the nature of semantic information processing. Thus the resolution of these problems necessitates the availability of a model which is capable of telling us what this semantic information is, i.e. how it is constituted and how it is organized ; in the absence of this model we would not be able to construct a clear idea of what simultaneous translation consists of. Perhaps such an idea is a bit premature, at least on the present level, but in addition, without this model we would not be able to formulate psychologically meaningful hypotheses or pose pertinent questions which would enable us to progress towards this knowledge of simultaneous translation by analysis and experimentation.

.../...

I shall thus discuss these problems in reverse order and expose certain considerations concerning them.

A psychological semantic theory is inevitably one of semantic memory and supposes that a certain number of invariants, or entities, exists, being inscribed in the long-term memory of the speaker and which are related or organized according to certain structures. This approach is perfectly compatible, at least under certain circumstances, with various linguistic, logical, philosophical or information processing concepts of semantics. In order for a theory to be comprehensive, it must of course be compatible with all facts emerging from these different disciplines.

Our starting point will be a concept of the semantic structure of memory, which may be characterized as being of the componential-predicative type. This concept involves the idea that the lexical units, the lexemes, which are stored in an individual's memory may be psychologically decomposed into smaller-format units which may be called "sèmes", semantic features, components, primitives, markers, etc. The primary characteristic of these units is that they are based on differentiations — or on oppositions, in structuralist terms — which a member of a given society is capable of forming within his world. We may remark in this context that certain facts related to translation, especially related to certain non-translatable utterances, are among the strongest arguments in favor of a componential theory. Within the framework of the concept adopted here, the structure of features within a lexeme is not different from the structure of words within a sentence or, more precisely, from elements (predicates and arguments), within a proposition : this is thus a predicative structure. The name I adopted for this theory is thus componential-predicative, but this will not be stressed here.

It should nevertheless be added that the componential structure of the lexical unit must be considered as including a flexible feature hierarchy i.e. features have a varying degree of salience, adhering more or less tenaciously to the central nucleus of the lexeme.

This idea of feature salience enables us to explain two very important types of effects in any utilization or comprehension of speech. One type involves effects related to polysemia and to the elimination of the ambiguities which normally occur as a result of the presence of polysemic

words in speech. It is accepted that polysemic words arising in a given context in the native language rarely result in false comprehension. There is, moreover, very often even a lack of awareness of the occurrence of polysemia, on the part of the speaker as well as the listener. As a result of conversations with translators, I presume that, except for true bilinguals, they have a greater awareness of polysemia than do ordinary listeners.

The second category of effects involves the metaphoric use of words and the varying degree of acceptability of metaphors. This is especially true when one passes from one language to another. If we suppose that two corresponding lexemes of two languages are theoretically composed of the same set of features (which is not so frequently the case) nevertheless a metaphoric use in the first language may be impossible to translate word for word ; this is apparently an indication of the fact that their features, even in this favorable case, may have a different hierarchical value. This obviously results in difficulties in translation.

This approach to the psychological aspects of lexical structure of course implies a series of theoretical options. They are different from the neo-associationist type of hypotheses advanced by other authors and also are different from those based, much too exclusively in my belief, on syntactical organization as described by recent theories of grammar.

The cognitive abilities of the speaker also include higher order structures, especially sentence structures. They may be conceived of as being composed of sets of places or cells used by the speaker to arrange, within syntactical and semantic restrictions, the units of semantic information, the features which are expressed in an utterance. The ordinary speaker selects the words he pronounces as a function of these pre-existing schemata. The "natural" listener also usually interprets the words he hears as a function of them and during the discourse he anticipates the words to come as a function of these schemata. A simple example of such a schema is that of an event, which may be approximately verbalized as follows : "Something happened to something — or to somebody — under certain circumstances (of time, of place, of manner,...)". The predicative writing of propositions precisely furnishes a fairly good formalization of this kind of analysis. It leads to a best understanding of three types of facts : how even grammatically incorrect

sentences can be interpreted, how people make inferences concerning missing information during discourse and also how "ideological" effects function, as a result of which the listener imposes his own prejudices on the sentences he hears.

Based on this, we may attempt to more precisely represent the processes occurring during simultaneous translation. As I stated above, simultaneous translation will be considered in the same context as translation in general, i.e. both obligatorily involving an initial phase of psychological transformation of the input text into an immediate semantic representation. This representation may be qualified as "basic", "abstract", even (which is less adequate) as "logical" or as "conceptual". Clearly in a large number of cases, this representation also contains emotional components, which may form a large part of it ; however this latter factor will not be considered here in order to remain within the context of the informative content of the message. Thus this semantic representation is the result of comprehension activity, which is precisely the psychological transformation of form into sense.

In the case of an interpreter who, by definition, is master of the input language, there is no reason to suppose a priori that the processes of comprehension used during simultaneous translation are any different from those underlying the ordinary comprehension of speech by an unilingual subject. We will discuss the other differences below.

Before this, however, it is convenient to discuss a phenomenon which is particular but very important. In unilingual understanding of speech, the whole process occurring may also be represented as involving two phases, the second of which seems to be different from that occurring during translation. The first phase indeed is composed of true comprehensional activity and its time scale is relatively short, on the order of fractions of a second or several seconds. After that, however, a second phenomenon develops with time, which involves mnesic processes and which we may characterize as forgetting and integration.

First the essential idea is that a listener begins to forget a sentence as soon as he hears it. It is, however, well established that this forgetting differentially and unequally affects the semantic and non-semantic characteristics of the text. The term non-semantic here refers to the phonemic characteristics, (or grapho-phonemic in the case of a written text), as well as to the surface syntactic characteristics to the extent that they do not have a directly semantic value. If we consider long-term events, e.g. several hours or several days, it is well known that the speaker or listener forgets the manner in which things were spoken more rapidly than that which was spoken.

We recently studied this differential decay, but during short intervals, i.e. on the order of several seconds. In one of these experiments (Verstiggel and Le Ny, 1977), subjects were asked to compare two sentences which were successively presented to them and to state, by pressing one or another button, whether these sentences "said the same thing" or not. The second sentence was presented either immediately after the first or after a lapse of 5 seconds. In the latter case, the subjects were prevented from thinking of the first sentence by asking them to loudly count backwards. The essential results are as follows : when the two sentences were absolutely, i.e. formally, identical, the subjects spent more time on recognizing their identity after an interval of 5 seconds than after no interval. On the contrary, when the two sentences were semantically, but not formally, identical, the second having undergone lexical modifications of synonymity or of superordination of terms, recognition of identity was more rapid, or at least was not less rapid, after 5 seconds than after no delay. It should be remembered that the subjects were occupied by counting backwards during these 5 seconds. The first conclusion from these results is that the decay of non-semantic components begins very quickly. On the other hand, semantic representation is not degraded during the initial seconds following sentence understanding, and in fact may even continue to evolve positively, even though the subject is occupied by the treatment of other information.

In the case of a continuous text, we may consider that the situation is both similar to and different from the above experimental situation. It is similar in that there is certainly also an evolution of semantic representation of the n^{th} sentence while the subject is occupied with processing the $n + 1^{st}$, the $n + 2^{nd}$, etc. sentences. The situation is different in that the information contained in successive sentences is normally related, which was not the case in the experiment previously cited.

An interesting problem may then be posed. There are several reasons for believing that the "fates" of the two types of information, semantic and non-semantic, vary as a function of the individual ; their decay, and the differences of their decay, may be very important for simultaneous translation in addition the evolution of these two kinds of forgetting may depend on previous learning.

In order to explain more precisely that question, I will thus present three hypotheses, which of course must be put to the test of verification.

1. The decay of the non-semantic information of the input text is more rapid in an expert interpreter than in the normal unilingual subject during the phase of comprehension ;

2. this rapid decline of the non-semantic information is essential for the exercice of the task of simultaneous interpretation, because it facilitates a better processing of semantic information ;

3. the formation of simultaneous interpretersmust involve exercises which will increase this difference between the two types of retention.

I personally do not believe that there are two distinct types of memory involved in this phenomenon, but rather that the retention affects two types of features, formal (or pre-semantic) and semantic, depending on the manner in which processing occurs at the moment of understanding.

If events indeed occur as I have outlined, it may be expected that retention of the sense of a text in the memory of an interpreter is particularly good. It should be better than that of beginning students and even occasionally better than that of ordinary unilingual listeners.

I would like to dwell a moment on this last comparison and on the hypotheses which may be formulated concerning it, which, as we will see, are somewhat contrasted. Suppose that at the end of a session of simultaneous interpretation we study that which is retained in relation to that which is stated, i.e. the recall of the semantic content of the text or of the conversation in question. We then propose a comparison of the recollections of a listener receiving unilingual information to those of the interpreter having performed the translation. Even if difficult, we suppose that we have equalized the parasite conditions, familiarity with the matter, motivation during

.../...

listening, etc. The question now becomes which of the two categories of "understanders" will have the best semantic recollections at the end of the session. After posing this question to several psychologists, the unanimous response I received was that it would be the unilingual listener, and I must admit that I would have answered as they, before examining the question in detail. There are at least two arguments in favor of this response. The first is that simultaneous translation obviously involves a double or even triple activity : the interpreter must translate and emit at the same time as he understands. Thus, according to a useful metaphor, all this occupies his information processing mechanism. Secondly, the interpreter does not have particular motivation for long term retention of the semantic content of the text or conversation he translates. To a certain extent, he must of course retain antecedents which constitute the framework of subsequent sentences, but a psychosemantic analysis probably would be able to show that several semantic elements found in the n - 20^{th} sentence are not necessary for the comprehension and translation of the n^{th} sentence. If these elements are retained, they are done so gratuitously, i.e. non-obligatorily. We would therefore be led to predict that the interpreter would forget them, based on a law of economy. An opposite argument might be developed for the unilingual listener and utilizer. These arguments put together lead to the prediction that the unilingual would remember the various semantic elements of the entire conversation better than the interpreter.

A completely different psychological argumentation may, however, be developed and which leads to the inverse prediction. Indeed, if we consider the interpreter's need to exhaustively process all information reaching him, from a semantic point of view, and if we also consider that memorization depends more on the depth and extent of this processing than on anything else, we are forced to predict that, at least in certain cases, the interpreter would have a superior recollection. It should be noted that it is merely necessary that this superiority be manifest occasionally, and not consistently, in order to create a bias in favor of the second explanation.

To my knowledge, there are no systematic studies on this subject, but several coherent observations support the second possibility. Apparently, it occurs rather frequently that interpreters have recollections that are more abundant and more precise than those of unilingual listeners of the

same session. The confirmation of these facts would contribute important analytical elements to our psychological understanding of incidental learning and, more generally, to that of the relationship between learning and the modalities of information processing.

These modalities will now be considered more directly in the context of their role in the activity of understanding. They may be represented as follows :

1. During the development of the temporal sequence constituting the spoken sentence, the morphemes and their grammatical cues, including of course their place in the sequence, are successively identified. I will dwell neither on the true perceptive aspect of this activity, nor on the heuristic processes which lead to its success.

2. The identification of a morpheme gives access to the corresponding meaning, which is conceived of as a set of features, as we have stated above. It may be admitted that there then occurs a more or less comprehensive semantic analysis of the meanings. This analysis involves an exploration of the set of features which obligatorily or potentially belong to the meanings in question, as well as a selection of the pertinent features for the construction of the semantic representation of the sentence.

3. This exploration and selection depend directly on the context. They are prepared by the expectations which previously modified the relief of the features, and thus the conditions of selection of the pertinent features We may thus explain, as already stated, the elimination of ambiguity of polysemic terms, comprehension of metaphors, etc...

4. The features thus selected are simultaneously recomposed in order to produce the semantic representation of the sentence with its different portions. Note that this representation may also involve emotional characteristics, as I mentioned earlier.

5. This recomposition occurs according to the semantic schemata of propositions or sentences at the subject's disposition.

6. If an adequacy ensues between the content of the sentence and pre-existing schemata, it creates a subjective sentiment of understanding.

The listener then continues to actively gather information from that which follows and to process it.

7. If such an adequacy does not occur, the listener receives internal information leading to a sensation of incomprehension. He then implements various heuristic devices to correct the situation. The most often used is the reexploration of the meanings ; but this may be accompanied by a decrease of the standards of adequacy and, more generally, by a relaxation of semantic restrictions in order to assure the entry of at least a part of the feature content into the preexisting schemata.

In the context of simultaneous interpretation, we might also represent the production of an output statement according to a symmetrical model. It should nevertheless be appreciated that even less evidences than for comprehension exist concerning the nature of sense transformation operations leading from a semantic representation to an adequate phonic chain. For that to occur, the speaker obviously must mobilize all the necessary motor programs, according to the corresponding semantic contents ; the manner in which this production occurs, particularly the memory search of these motor programs, is still ill-understood. It should be noted to what point simultaneous interpretation offers an exceptionally interesting research situation in this regard. In comparison to other situations, it includes a much better possibility to understanding of "what the subject wants to say" before speaking and the compare this to what he actually says ; I will, however, leave this subject here.

Another interesting question to be explored in simultaneous translation is, does the interpreter's preparation of the emission in the output language modify his semantic representation of the input sentence and if so, how. This problem may be approached on a lexical level or on that of sentence structure in general ; it appears to me that both levels must yield a positive response. It is clear that the existence of important differences in a given syntactic or semantic component of two languages will force the interpreter to impose the second language structure on the first structure. Thus, the translation from German to French or to English inevitably modifies, as a result of obligatory word order changes, e.g. in

subordinate clauses, the quantity of information which must be stored in the interpreter's working memory, and forces him to restructure these clauses. The same types of examples, but less obligatory may be found in English-French and French-English translation, concerning the different use frequencies of active and passive voices. A similar situation exists between Russian and English or French concerning the handling of verb aspect, or in the different use of verbs or nominalizations of verbs. Similarly, for these three languages, does the distribution of new and old information on articles (definite or indefinite) or the absence of articles modify the structuration and comprehension.

An important idea evolves from this question and which is related to the idea developed concerning semantic and non-semantic forms of recollection. Since the principal problem posed in any translation is actually the non-concordance between the semantic structures of two given languages, the good simultaneous interpreter seems to be he who directly transforms the organization of information, simultaneously with comprehension activity. This results in the information being immediately entered into the grammatical and semantic schemata of the output language. Except in the case of a perfect bilingual, this is demonstrated by the fact that the native language is the interpreter's output language. The situation of interpretation in this regard is not fundamentally different from that of the unilingual paraphrase, for example in the science writer, who must "translate" the content of a specialized text into a language which is comprehensible by a large general audience.

Thus the following parallel activities must occur during interpretation :

1. Contemporaneous with the perception and semantic analysis of the input conversation, a second mental activity occurs, that of anticipation in the output language ; this is composed of successive expectations of meanings corresponding to the output language.

2. As the morphemes of the input text are perceived, their significance is compared to that which was expected, and if a suitable adequacy obtains, the sentence, clause or syntagm are loudly emitted.

I will illustrate this hypothetical mechanism by describing a unilingual experimental situation (in French) which was recently employed

(Le Ny and Carfantan, in preparation). It involved the presentation of an isolated word, followed by a sentence, to subjects, who were asked to retain the isolated word in their memory and to press a button as soon as that word appeared in the sentence. Of course, there was an equal number of isolated words which did not appear in the subsequent sentence, which normally led to a "no" response by pressing another button. There were two types of "yes" responses, the first of which consisted of the presentation of a word which was then found textually in the sentence which followed ; the other involved the presentation of a word which was not found per se in the sentence presented, but rather which could serve as the title of the sentence. The subjects were informed of this fact and knew that they had to answer "yes" as soon as they had all the semantic information at their disposal which would enable them to match the significance of the sentence and that of the title word.

This type of activity clearly demands the analysis of the semantic information contained in the elements of the sentence, as well as its recomposition into a unit which may be compared to the potential title word. The results show that this activity may be performed very rapidly, even, as in the present case, when formal and semantic identification are in competition. The majority of the francophone subjects were able to correctly identify the title well before having processed the entire sentence and also without discontinuing the processing. In fact, since the title corresponded to the information contained in the couple subject + verb or in the couple verb + object, its identification was hardly longer than the identification of the second word of the couples. On the other hand, for bilingual subjects whose second language was french, title identification time was longer than that of the last word of the sentence. In this case, semantic processing clearly did not operate in parallel with formal (word for word) processing.

Without going into detail here, and although this experiment was performed unilingually in a reading and not conversational situation, it suggests a processing model which may be transposed to simultaneous translation. It illustrates a trained subject's capacity to analyse a semantic content and to rapidly compare the result of this analysis and subsequent recomposition to a preexisting lexical schemata in order to emit an adequate response.

.../...

I believe this capacity to be inherent to simultaneous interpretation The processing of input information aims at the construction of a semantic representation which is immediately consistent with syntactic and lexical schemata of the output language. Actual emission under these conditions may then be merely a behavior subordinated to this representation which is already interpreted.

The last point I will briefly consider is the problem of temporal regulation, which is an important aspect of simultaneous translation. In the present context, "simultaneous" is evidently inexact, since the interpreter must divide his work between two principal activities, which in reality are only slightly separated temporally. In this regard and in spite of the differences that we may provisionally ignore, we are in a situation comparable to the reading of a text in a loud voice : comprehension and emission are separated by a delay corresponding to the continuous filling and emptying of the processing mechanism.

We could speak here of "short term memory", but this concept in the literature instead involves ideas concerning rehearsal, limited capacity of phonemic storage and retention. Stated in other terms, the existence and the importance of a "working memory" cannot be seriously questioned here. It encompasses three problems which must be conceived of as being closely related.

The first is the rapidity of the interpreter's work and his adaptation to the rapidity of the speech to be translated. The second is the cutting of the speech into operating blocks and the third involves the limitations of the capacity of the interpreter's working memory and its eventual overload. It seems that these three problems have a common solution, based on the notion of the flow of semantic information.

It is known that good empirical evidences exist supporting this thesis that the processing of a unilingual oral conversation occurs in units, generally corresponding to the clause, (or the sentoïd). In simultaneous interpretation it appears that shorter units are actually used when the clauses are long. These units may be prepositional syntagms or even morphemes. In this case, the interpreter utilizes the anticipatory capacity of the

.../...

listener ; he opens points of suspension, in a manner of speaking, and has confidence in the listener that he will himself reconstruct larger sense units. It is undoubtedly useless to say that it is not a good idea to pursue this approach too far, but this behavior of the interpreter is a function of the characteristics of the input dialogue, especially its formal rapidity.

There are nevertheless good reasons for thinking that information flow should be defined not so much by these formal characteristics (for instance the number of words per unit time) related to the speaker's loquaciousness, but, once again, by the semantic properties of the speech. Apparently the pertinent variable in this situation is the quantity of semantic information produced by the speaker.

How then may this parameter be determined ?

A series of unilingual experiments with written material yielded results which, here again, are capable of being transposed, at least conjecturally. The main conclusion reached is that the quantity of features carried by the sentences determines the time required for their processing. Thus, for sentences of equal lengths, in terms of numbers of words, and which also are otherwise comparable, subjects require more processing time when the lexical content of the sentence is more specific, i.e. when the terms of the sentence are more precise. The model advanced above justifies our being able to analyze this as a greater semantic richness (Le Ny, Denhière and Le Taillanter, 1973). More exactly, it appears that the processing time for a sentence depends on the new semantic information it contains, i.e. the quantity of features appearing in addition to those already encountered in the discourse (Cordier and Le Ny, 1975 ; Le Ny, 1977). These results could be related to those of Kintsch and Keenan (1973), which has shown that for sentences of equal lengths, their processing times are a function of the number of propositions they contain.

All of these evidences are consistent with the model presented : in self paced conditions the subject admits a quantity of semantic information into his working memory which corresponds to its capacity, and then processes it. When this operation is terminated, he transfers this information to another apparatus and only at that moment can he admit another block of information. In the experiments presented, this second apparatus was the long term memory of the subject, since its task was to memorize the text. It is

.../...

not quite the same thing in the case of simultaneous translation since the interpreter "empties" his working memory by emitting a portion of the speech. We have seen that this in fact does not in the least prevent this information from being entered into the long term memory. The difference between interpretation and ordinary reading is that the simultaneous interpreter is not master of the rate of information flow and his processing mechanism may occasionally become overloaded. The empirical observations that have been made concerning this question are, however, consistent with what we have just said : the determining factor is not so much the formal rapidity of the speech, the loquaciousness of the speaker, but rather the flow-rate of new semantic information arriving, formal rapidity merely being an aggravation factor. The professional experience of the interpreter undoubtedly helps greatly to progressively reduce the extent of this flow by decreasing general newness of that what is heard. Prior familiarity with a text similarly aids the interpreter to reduce the flow of oral semantic information on a given subject.

Several considerations have been presented concerning a psychosemantic analysis of simultaneous interpretation. As we have seen, a fair number of them are conjectural and are based on generalizations drawn from the psychological analyses of other situations. They are nevertheless consistent with empirical observations of the interpreter at work. It is certain that a more systematic psychological study of simultaneous translation would contribute knowledge useful for the exercise, and particularly for the training, of this profession. In addition, because of the rather exceptional cognitive skills utilized by the interpreter, this study would also lead to a deeper understanding of the processes involved in the comprehension and functioning of language, as well as of the psychological structures upon which it is based.

REFERENCES

CORDIER (F.), LE NY (J.F.). - L'influence de la différence de composition sémantique de phrases sur le temps d'étude dans une situation de transfert sémantique, Journal de Psychologie normale et pathologique, 1975, 1, 33-50.

KINTSCH (W.), KEENAN (J.M.). - Reading rate as a function of the number of propositions in the base structure of sentences, Cognitive Psychology, 1973, 5, 257-274.

LE NY (J.F.). - Appredimento e semantica, to appear in Italian.

LE NY (J.F.), DENHIERE (G.), LE TAILLANTER (D.). - Study-time of sentences as a function of their specificity and of semantic exploration, Acta Psychologica, 1973, 37, 43-53.

VERSTIGGEL (J.C.), LE NY (J.F.). - Information sémantique et mémoire à court terme : l'activité de comparaison de phrases, Année Psychologique, 1977, 77, 63-78.